

UNITED STATES DISTRICT COURT  
DISTRICT OF MINNESOTA

August Technology Corporation, and  
Rudolph Technologies, Inc.

Plaintiffs,

v.

MEMORANDUM OPINION  
AND ORDER  
Civil No. 05-1396

Camtek, Ltd.

Defendant.

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Daniel McDonald, Ernest W. Grumbles III, and Joseph E. Lee, Merchant & Gould P.C. for and on behalf of Plaintiffs.

Michael Florey, Ann Cathcart Chaplin, David Francescani, Edmond R. Bannon, John D. Garretson and Michael F. Autuoro, Fish & Richardson P.C. for and on behalf of Defendant.

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This matter is before the Court upon Defendant Camtek, Ltd.'s ("Camtek") motion for summary judgment of invalidity of U.S. Patent No. 6,826,298 (the '6,298 patent), an "automated wafer defect inspection system and a process of performing such inspection."

Camtek argues it is entitled to summary judgment with respect to claims 1 and 3 of the '6,298 patent, as these claims are invalid for indefiniteness as a

matter of law under 35 U.S.C. § 112. Camtek argues that the claims are indefinite because there is no way to determine if a wafer is “sufficiently free of defects for training purposes” without relying upon a particular user’s unspecified criteria. Camtek further argues the claims are invalid as indefinite because the claims contain apparatus limitations and a method limitation which is not permitted under 35 U.S.C. § 112, ¶ 2.

### Standard

The purpose of claims in a patent are to “distinctly claim[] the subject matter which the applicant regards as his invention.” 35 U.S.C. § 112, ¶ 12. This requirement is met “when [the claims] clearly distinguish what is claimed from what went before in the art and clearly circumscribe what is foreclosed from future enterprise.” Datamize, LLC v. Plumtree Software, Inc., 417 F.3d 1342, 1347 (Fed. Cir. 2005) (quoting United Carbon Co. v. Binney & Smith Co., 317 U.S. 228, 236, 63 S.Ct. 165, 87 L. Ed. 232 (1942)).

Claims are not indefinite because they present a difficult task of claim construction. Halliburton Energy Services, Inc. v. M-ILLC, 514 F.3d 1244, 1249 (Fed. Cir. 2008). “If the meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable

persons will disagree, [] the claim [may be] sufficiently clear to avoid invalidity on indefiniteness grounds.” Id. (quoting Exxon Research & Eng’g Co. v. United States, 265 F.3d 1371, 1375 (Fed. Cir. 2001)). “Only claims ‘not amenable to construction’ or ‘insolubly ambiguous’ are indefinite.” Datamize, 417 F.3d at 1347 (citation omitted).

**1. Plurality of Known Good Quality Wafers (Claim 1) and “Multiple Known Good Wafers (Claim 3) are Indefinite.**

The ‘6,298 patent includes five claims, 1 and 3 being independent claims.

1. An automated system for inspecting a substrate such as a wafer in any form including whole patterned wafers, sawn wafers, broken wafers, and wafers of any kind of film frames, dies, die in gel paks, die in waffle paks, multi-chip modules often called MCMs, JEDEC trays, Auer boats, and other wafer and die package configurations for defects, the system comprising:

- a wafer test plate;
- a wafer provider for providing a wafer to the test plate;
- a visual inspection device for visual inputting of a plurality of known good quality wafers during training and for visual inspection of other unknown quality wafers during inspection;
- at least one of a brightfield illuminator positioned approximately above, and a darkfield laser positioned approximately about the periphery of the wafer test place, all of which are for providing illumination to the unknown quality wafers during inspection and at least one of which strobes to provide short pulses of light during movement of a wafer under inspection based on a velocity of the wafer; and
- a microprocessor having processing and memory capabilities for

developing a model of good quality wafer and comparing unknown quality wafers to the model.

3. An automated method of inspecting a semiconductor wafer in any form including whole patterned wafers, sawn wafers, broken wafers, and wafers of any kind of film frames, dies, die in gel paks, die in waffle paks, multi-chip modules often called MCMs, JEDEC trays, Auer boats, and other wafer and die package configurations for defects, the system comprising:

training a model as to parameters of a good wafer via optical viewing of multiple known good wafers;  
illuminating unknown quality wafers using at least one of a brightfield illuminator positioned approximately above, and a darkfield laser positioned approximately about the periphery of the wafer test place on which the wafer is inspected, all of which are for providing illumination to the unknown quality wafers during inspection and at least one of which flashes on and off during movement of a wafer under inspection at a sequence correlating to a velocity of the wafer; and  
inspecting unknown quality wafers using the model.

This Court issued its claim construction opinion on January 2, 2008.

In that Order, the term “Plurality of known good quality wafers/multiple known good wafers” was construed as follows: “multiple wafers that are recognized individually or as a whole to be sufficiently free of defects for training purposes (e.g. die that have been inspected, tested or otherwise reviewed prior to or during training).” Camtek argues that this construction cannot be translated into any meaningful claim scope because it does not provide information as to

the quantity, size and/or type of defects that are permitted in a wafer to be “sufficiently defect free.”

Plaintiffs assert that claim 1 is an apparatus claim with five interrelated components. The phrase at issue relates to the function of one of the components - a visual inspection device. Plaintiffs further assert that claim 3 is a method claim involving three steps: training, illuminating and inspecting. This claim covers methods that involve a training step whereby wafers are considered good enough for training purposes. Plaintiffs assert that the exact numerical measure of the quality of the wafer is not relevant to the proper claim scope, as the step simply involves training, that is using wafers considered good enough for training. Users of the machine understand how to use the machine without being instructed on specific numeric characteristics of a good quality wafer.

In support of its argument, Camtek cites to the decision in Halliburton, supra. In Haliburton, the Federal Circuit held that the term “fragile gel” was indefinite because nothing in the claim language or specification specified “what quantity, weight, size and/or volume of cuttings must be suspended” for a gel to be a “fragile gel.” Id. 514 F.3d at 1254. Camtek argues that as in Halliburton, nothing in the claim language or specification of the ‘6,298 patent specifies the

quantity, size and/or type of defects that are permitted in a wafer to be “sufficiently defect free.” As a result, there is no clear delineation of what is a “good quality wafer” versus a “bad quality” or “unknown” wafer.

Plaintiffs respond that Halliburton is not on point, because the “fragile gel” language was relied upon to distinguish prior art gels, therefore it was important that the phrase be defined sufficiently at least to distinguish between prior art. In this case, however, the ‘6,298 patent is not claiming a wafer, it is claiming a visual inspection device that can input data from a wafer, be it of good quality or bad. It is thus not necessary to precisely define a “good quality wafer” in order to distinguish prior art, or to recognize the metes and bounds of the invention.

To demonstrate that the claims are definite, Plaintiffs cite to the expert report of Dr. Joseph Mundy, in which he discussed the scope of the training embodiments, and noted that the wafer should:

exhibit[] variations that are considered normal process variations (bridged metalization in the previous section was not a normal variation.) If this were not true, then the inspection model will be trained to have tolerances that are too loose to capture defects or to impose non-existent defects on wafers of unknown quality.

The claims do not require that every die on a wafer be good in order to be suitable for training. The only training requirement is that is possible to derive a model of a good wafer from the die that are input to the training

algorithm. Further, the claim does not require that a good die be free of defects; only that the defects are not great enough in number or correlated in position so as to confound a training algorithm constructed according to the teaching of the specification.

Lee Declaration, Ex. A, p. 21-22. Clearly, Dr. Mundy's understanding of the claim phrase "known good quality" is definite and consistent with the Court's construction.

In reply, Camtek argues that following the Datamize and Halliburton decisions, the '6,298 patent must provide an objective basis as to the bounds of these three classifications of wafers. Because what is ultimately determined to be a known good quality wafer depends on the subjective criteria of the user, the lack of an objective basis renders the claim indefinite.

In addition, Camtek asserts that its experts readily identified the specific indefiniteness problems with Plaintiffs' proposed definition of the terms. Dr. Mellor concluded that Plaintiffs' coined phrase "sufficiently free of defects for training purposes" was circular and thus insolubly ambiguous. Autuoro Decl., Ex. K at ¶¶ 34-35. He further concluded that one of ordinary skill in the art would not understand the bounds of "recognized individually or as a whole":

The clause recognized individually or as a whole is ambiguous. It leads to a situation where, unless the set of wafers is known to be defect free (which

contradicts the plaintiffs' definition), a determination cannot be made about an individual wafer on its own. A wafer must be judged relative to other wafers used for training. Adding or deleting a wafer could unpredictably make the set insufficient for training. Therefore one of ordinary skill in the art would not be able to determine the meaning of "sufficiently free of defects."

Id. ¶ 36. See also Autuoro Decl. Ex. L, Dr. Adler Rebuttal Report, ¶¶ 42-43

(finding definition of "known good quality wafers" is indefinite because it would blur distinction between known good and unknown quality wafers.)

The Court finds that claims 1 and 3 of the '6,298 patent are not invalid as indefinite because the term "known good quality wafers" is not more clearly defined. The innovation of the '6,298 patent is an automated wafer inspection system - not the wafers themselves. The wafers are not claimed, they are referenced solely with respect to the capabilities of the system - training and inspection. Furthermore, an automated wafer inspection system must be adaptable to the end user's needs, therefore a precise definition of "known good quality wafer" would run afoul of the innovation of the patent. Plaintiffs' expert, Dr. Mundy, demonstrated that "known good quality wafer" is sufficiently definite to allow others to recognize the specific limitations of the '6,298 patent.



**2. Apparatus Claim 1 Incorporates a Process Limitation and is Therefore Indefinite.**

Camtek also argues that the phrase in claim 1 - “visual inputting of a plurality of known good quality wafers” - is a method limitation that requires active user participation. Camtek asserts that a single claim involving both an apparatus and method-of-use of that apparatus is invalid as indefinite, because it is not sufficiently precise to provide a person of ordinary skill in the art with an accurate determination of the metes and bounds of the patent. IPXL Holdings, L.L.C. v. Amazon.com, Inc., 430 F.3d 1377, 1384 (Fed. Cir. 2005).

Plaintiffs respond that IPXL stands for the narrow rule that a single claim may not purport to cover both a system and a specific method of using that system. In this case, however, claim 1 does not include such an improper combination. Claim 1 recites a system with functions, not a system and the use of the system. The “for” language used in claim 1 indicates functionality that could be implemented in hardware or software, which is common and appropriate.

Apparatus claims are not necessarily indefinite because they include functional language. Halliburton, 514 F.3d at 1255. Language that describes the capabilities of a system component is a functional limitation, not a method

limitation. Collaboration Prop., Inc. v. Tandberg, Inc., 2006 U.S. Dist. LEXIS 42465, at \*19 (N.D. Cal. June 23, 2006). The Federal Circuit has explained that the holding in IPXL was based on “the lack of clarity as to when the mixed subject matter claims would be infringed.” Microprocessor Enhancement Corp. v. Texas Instr. Inc., 520 F.3d 1367, 1374 (Fed. Cir. 2008). Where no such ambiguity exists in the claims at issue, the claim is not invalid. Id. at 1375.

With respect to claim 1 of the ‘6,298 patent, the Court finds that the phrase “visual inputting of a plurality of known good quality wafers” describes the functionality of the “visual inspection device”, not a specific method of using that system or requiring use. See, Collaboration Prop., 2006 U.S. Dist. LEXIS 42465, at \*19 (finding the following claim language recites the functionality of a claimed system “the system is configured to reproduce images, based on data signals”). See also, Yodlee Inc. v. Cashedge, Inc., 2006 U.S. Dist. LEXIS 86699, at \*17-18 (N.D. Cal. Nov. 29, 2006) (finding that IPXL does not apply when the claims describe what the apparatuses do when used a certain way, not to claim the use of the apparatus). Thus, claim 1 is not invalid as indefinite as a claim containing apparatus limitations and a method limitation.

Accordingly,

IT IS HEREBY ORDERED that Defendant Camtek's Motion for Summary Judgment as to Invalidity [Doc. No. 280] is DENIED.

Date: July 13, 2008

s / Michael J. Davis

Michael J. Davis

Chief Judge

United States District Court

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